

# JOURNAL OF CALENDAR REFORM

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## POPULAR ACCEPTANCE

*By PROFESSOR BRISTOW ADAMS  
of Cornell University*

In a letter accompanying this clear and pointed study of calendar problems, Professor Adams says: "After many years spent in studying practical methods of higher education, I have learned that no movement which depends on popular acceptance can hope to succeed unless its objects can be stated simply and understandably to ordinary folks. Can the need of calendar reform be so stated? Can the effect of simplification be made comprehensible to the ordinary citizen? Are our own thoughts on this subject sufficiently clarified to stand this acid test? In the enclosed manuscript I have endeavored to give the ABC's of the calendar problem in such form that he who runs may read. How far I have succeeded is for your readers to say—and I shall be interested in their comments and responses."

**W**HAT'S wrong with the calendar? Suppose you had to carry a different time-table for every day of the month? Luckily, you don't, for the calendar of every day is just the same—just 24 hours. But if each day had, say,  $24\frac{1}{8}$  hours, and if the hours ran along consecutively, independent of days, wouldn't it be difficult to tell the time?

And wouldn't you want to have the system simplified?

Well, that's the present situation with regard to the year and the days of the week. The ordinary year has  $52 \frac{1}{7}$  weeks. This peculiarity alone would necessitate seven different "time-tables," or calendars for seven different years. But every fourth year, or Leap Year, has  $52 \frac{2}{7}$  weeks. This multiplies the complications. Consequently a given year's calendar

is duplicated only at rare intervals. And so, practically speaking, every year is different.

The result is that no one can tell, except by referring to calendars or by laborious reckoning, on what day of the week a future date will fall. In business, it is almost always desirable to avoid Sundays or holidays in setting a date for a future business transaction. And so, every day thousands and thousands of business men interrupt their work and their conferences to go look for a calendar or to figure out dates of future years for which no calendar is readily available.

Computation of future dates is made much more difficult by the lack of uniformity in the lengths of months. Some months have 31 days, some 30, and February, 28. Furthermore, every fourth year, February has 29 days. Most people are unable to remember which months have 31 days, and which have 30, except by the cumbersome school-learned jingle:

Thirty days hath September,  
April, June and November.  
All the rest have thirty-one,  
Except the little one alone,  
Which has twenty-eight in fine  
Till Leap Year brings it twenty-nine.

Lack of uniformity among months, of logical pattern in the sequence of months of different lengths, and, in the case of February, irregularity, makes the mental computation of such items as time spaces, monetary interest, etc., annoyingly difficult.

Since holidays come on varying days of the week, annual schedules for all sorts of businesses have to be revised every year. Business organizations such as railroads, bus companies, hotels, ice-cream distributors, and other enterprises, which have to make special provision for holidays, are hard put to estimate requirements. If holidays, for instance, were always to fall on Monday, they would get to know approximately the accommodations required. But, as dates shift from year to year, they never have recent previous experiences as a guide.

Probably the most usual, off-hand suggestion for simplifying the calendar is to call 360 days one year. This would obviously provide just 12 months of 30 days each.

But what about the weeks? Seven is not divisible into 360 and no juggling of figures discloses any number near 360 evenly divisible by both 12 (for months) and 7 (for weeks).

So, in view of the prime importance of having the weeks coincident with the years—so that given dates will always recur on the same week-days—one sacrifices the cause of the uniform month and suggests a 52-week year of 364 days.

Fine! But calling 364 days a year will not make them a year. The day represents one revolution of the earth on its axis. The year repre-

sents one cycle of the earth around the sun. Now the earth revolves about  $365\frac{1}{4}$  times while swinging through its orbit. Years and days do not harmonize in simple arithmetic. Only once in 43,200 years does a year begin within one second of midnight. Usually it may begin some time during January 1. It keeps falling behind our 365-day so-called year by about six hours each year, till every fourth year, called Leap Year, we set our calendar year right by counting in a 366th day.

Now, if we tried to call 364 days a year, the real year would fall behind the so-called year by about  $1\frac{1}{4}$  days a year. In four years the calendar would be about five days behind and the necessary Leap Year adjustment would have to be still more drastic.

In reconstructing the calendar, then, one starts with the specification that the year comprises 365 days, as at present, with an extra day for every fourth year.

*The World Calendar.* Since it has proved feasible to regard every fourth year as containing an extra day, why not regard every fifty-second week, the last of the year, as containing an extra day? This is the conception of the year by which The World Calendar eliminates all the practical difficulties of reconciling days, weeks, months, quarters and years.

The World Calendar starts the year with the first day of the week, Sunday. As the fifty-second week falls one day short of completing the 365-day year, the extra day is regarded as a duplicate Saturday. The continuing year begins automatically on Sunday, and so on till Leap Year.

Whether this duplicate Saturday be accepted in popular fancy as such is relatively unimportant. It may come about that people will regard it merely as a day apart from all weeks. In all probability it will be known as Year Day, an international holiday, and the occasion for celebrating the incoming new year. It is important, however, to note that the day will have to be accounted for in many business affairs and will be included in practice in the last week and in the last month of the year.

Leap Year presents an additional extra day similarly to be handled outside the sphere of the regular week. Should this be regarded as a second duplicate Saturday, appended to the last day of an otherwise normal 365-day year? Herein might appear to be the simplest disposition.

But since, at present, the quadrennial Leap Day is distinctly marked off as February 29, it is probably best to keep the distinction clearly marked. As Leap Day would be regarded as somewhat apart from the scheme of week-days, and would therefore be another international holiday, The World Calendar assigns it to summer, placing it at the end of the twenty-sixth week as a duplicate Saturday, corresponding with Year Day at the end of the fifty-second week.

Since 365 days are not evenly divisible into 12 months, and since it is not practical to assign fractions of days to months, the 12 months cannot

be of uniform length. The nearest approach to uniformity is to have four months of 31 days each and eight months of 30 days each.

For the sake of simplicity, it is desirable that the long months should occur in logical order or according to a pattern easy to memorize. Since, fortunately, there are just four such months, The World Calendar places one in each seasonal quarter. Thus the four quarters are made equal in number of days, except for the fourth quarter, which will in practice probably be construed as including an extra day, Year Day, and except for the second quarter which will, every fourth year, probably be construed as including the extra day, Leap Day.

On making up a calendar in which every quarter has one month of 31 days and two months of 30 days, for a total of 91 days, the beauty of the scheme becomes apparent. Every quarter has exactly 13 weeks!

As apparent on the calendar tables, every quarter begins on Sunday and ends on Saturday. Consequently, not only is the calendar constant for every year (except for Year Day and Leap Day), but also for every quarter (except for Year Day and Leap Day).

The World Calendar assigns the thirty-first day falling in each quarter to the first month of each quarter. Here are some of the reasons: For ease in remembering, the 31-day month of the quarter should be the first. Since Year Day and Leap Day may be regarded popularly as December Y and July L respectively, immediately setting them apart as holidays (both coming at the end of the third month in a quarter) the first month suggests itself. Making up the schedule on this basis, it develops that the first month has five Sundays and the third month five Saturdays, whereas under the scheme of assigning 31 days to the third month the third month would have both five Sundays and five Saturdays. Furthermore, each month has the same number of week-days, 26.

*Advantages of The World Calendar.* With the calendar identical for every year and for every quarter, it can be easily committed to memory. Most children will learn it subconsciously before they reach school age. February 2 will be synonymous with Thursday; July 8 with Sunday, and so on. Reference to a calendar will be entirely unnecessary. Calendar printing will be a formality. One may expect to see "perpetual calendars", chiefly for ornamental purposes, engraved in precious metals.

While the conveniences resulting from the stabilization of the time schedule by The World Calendar would be of the greatest benefit to the mass of people, it is probable that business advantages closely linked to calendar schedules would be of still greater total weight. Even in the mere matter of calculating interest on loans, the savings in mental effort would be enormous.

From the point of view of business, the stabilization of the month with regard to the number and allocation of Sundays, Saturdays and other

week-days—not to mention dated holidays—is the most spectacular reform. Only by this means can the various months, in terms of their respective statistics, be fairly compared with one another and with their counterparts of other years.

Under the existing calendar the months are in no way comparable, as all vary from year to year. Under The World Calendar a given month will be absolutely comparable with the corresponding months of other years. Months will not, perhaps, be absolutely comparable with one another. But, since their relations with one another will be fixed and definite, they will be relatively comparable.

Statistics for no two months can ever be absolutely comparable. The events of a month of summer, for instance, can hardly ever be compared with those of a month of winter. Furthermore, the irregular interposition of holidays upsets such calculations.

Under The World Calendar, experience will determine the normal ratios between the statistics of the various fixed months. When these ratios are applied the comparisons will be absolute.

*The 13-Month Calendar.* To make the months easier to compare, it has been suggested that months be terminated at the end of every four weeks. Since there are 52 weeks in the year, and since 52 is divisible by four, this suggestion, calling for 13 months instead of 12, is feasible, ingenious and fascinating.

In view of the absolute incomparability of months with one another, because of the progress of the seasons and the interposition of holidays, it is obvious that experience ratios would have to be applied to the statistics of the various four-week months exactly as to the months under the twelve-month World Calendar.

There is just one exclusive advantage in the thirteen month calendar, namely, that the calendar for one month could serve as the calendar for all months. It would perhaps be slightly easier to memorize than the quarterly-basis World Calendar. But since The World Calendar would be learned subconsciously in pre-school age, this advantage is nominal.

*Defects of 13-Month Calendar.* The defects of the thirteen-month calendar, however, are formidable. First, it does not recognize the quarterly seasons of the year as multiples of months.

Second, its year is not divisible by months into halves, thirds, quarters, sixths, or twelfths.

Third, the biggest working day of the month, for accounting, billing, mailing, paying salaries, taking inventory, etc., always occurs on Saturday, a day already overcrowded in some lines and a day which eventually will be made a holiday.

Fourth, all monthly accounting, of rents, interest and dues, have to be figured in terms of a thirteenth of a year. The number 13, which is

difficult to figure with, would occur billions of times a year in everyday reckoning. This would be a hardship to the small business man and a huge expense to the big business man.

Fifth, it would no longer be practical to figure interest by the month. On the 30-day basis, the ordinary interest, on one dollar at six per cent. for one month is one-half cent. But, on the 28-day basis, the interest for one month is \$.004615 plus. One could no longer calculate interest mentally from month to month.

Finally, all the routine activities which occur in the course of a month—such as attending meetings, paying bills, servicing machinery and collecting statistics—would have to be repeated once more every year.

Inadequate as the existing calendar is, it is probably preferable to the 13-month calendar. But, were the 13-month calendar to be regarded as an improvement, it could hardly be inaugurated universally.

The conception of the year as having 12 months is so deeply ingrained in the minds of the masses that a 13-month year would probably be understood by only a small proportion of the population, representing the top crust of intellectual strata.

An attempt to decree a 13-month calendar might throw the affairs of the world into confusion. Having witnessed the considerable difficulties in connection with such a simple and conservative reform as daylight saving, one is in a position to appreciate the upheaval which might follow so radical a tampering with time as is involved in the 13-month plan.

*Secondary Benefits of The World Calendar.* Changes required for the institution of The World Calendar, however, are nominal and their inauguration would be almost imperceptible. February would gain two days. April would gain one day; March, May, August would each lose a day. December 31 would become Year Day. The calendar can be put into effect at the beginning of a year normally starting on Sunday, such as 1933.

Incidentally, The World Calendar looks forward to the five-day working week. The allotment of five Sundays and five Saturdays respectively to different months is done with an eye to the time when Saturdays may be full holidays instead of, as in many places at present, half days.

At the present time, the majority of economists ascribe current economic ills to over-production and under-consumption. The difficulty is understood to be that some people work too hard, monopolize jobs, and lack leisure for spending. Even President Hoover has suggested a more equitable distribution of opportunities to work and to earn through a shortening of working hours. In preparing for an ultimate five-day working week, with occasional four-day weeks, where holidays occur, The World Calendar is of peculiar economic and social significance.

# AS THE FARMER SEES IT

By DAVID THIBAULT  
Formerly Editor of "Modern Farming"

**I**N THE writings upon the subject of calendar reform, the agricultural interests have been singularly neglected. Fortuitous references to seed-time, to the science of animal breeding, and to subjects which the writers evidently consider as mere matters of routine statistics, are about all that one can uncover upon an issue that, carried into fact, will affect the farmers more profoundly than any other group. It is expedient as well as just to go more deeply into the attitude of agriculture toward calendar reform; for if the movement finally comes up for ratification by national and state legislative bodies, it may well be that the agriculturists, still a powerful if not a dominant group in many nations, will finally decide the matter.

It would seem, then, that the support of agriculture is highly desirable, perhaps essential. How can proponents of calendar reform secure this support? What essentials does the farmer require in his time reckoning system? How closely is his work bound up with the passage of months, seasons and years?

It is axiomatic that the farmer is conservative. It is to his credit that he is so, but this quality was not brought about by conscious planning of his own. His work and his life are intimately geared to the slow and inexorable forces of Nature. The rotation of the earth, the circuit of the sun, the slow revolution of the seasons, are not merely convenient divisions of raw time to him, but they are the crude materials out of which he manufactures, with the aid of the earth, the products that bring him a livelihood. In industry and art the big word is "how." With the agriculturist "how" is also important, but "when"—literally *when*—is paramount. Scientific knowledge does not yet enable the farmer to advance seed-time appreciably over a large area, nor does it give him the means to repel frost from a countryside. But the traditions, statistics, records and "lore" of his craft give him knowledge, based upon seasonal comparison of conditions, which equips him to carry on.

Even those with the meagerest practical knowledge of agriculture can have no difficulty, if they permit themselves to think upon the matter, in perceiving how vitally the farmer's business is bound up with knowledge of the seasons. Long before Egyptian priests evolved the lunar calendar as a concrete entity, tillers of the soil had identified in their own minds the return of planting time and harvest time with the revolution of the seasons. Perhaps ancient theologists created the calendar; but certainly

ancient agriculturists before them employed the knowledge and the principles which the calendar records.

With the farmer's dependence upon the calendar in mind, and with cognizance of his God-given conservatism, we can hardly vision him accepting a calendar which departs too radically from the system of time reckoning now in use. For him to seek adjustment to a system too radical, it would be necessary that he cast overboard the foundation material upon which the traditions and the science of agriculture rest. It is not saying too much to predict that the support of the farmer will be given to calendar reform in precise proportion to the conservatism of the reformation suggested. He is not to be blamed for this; but whether his attitude elicit blame or praise, we must reckon with it.

It is assumed that the reader is conversant with the salient features of the two major plans for calendar reform which will come up for attention before a General Conference of the League of Nations at its meeting October 26, 1931. However, since one of these plans proposes changes so radical that its acceptance by agriculturists throughout the world seems impossible, it is expedient for purposes of contrast and emphasis to outline briefly the alterations in our present system of time reckoning now under serious consideration.

*The World Calendar* is a revised twelve-month calendar in which the year would consist of equal halves and quarters, and would contain 364 days. The quarters of the year would consist of three months each. The first month of each quarter of the year would contain 31 days, and the other two months of the quarter, 30 days each. The first day of each quarter would begin on the first day of the week; the second or middle month of each quarter would begin on the middle day of the week, Wednesday, and the third month—the last in each quarter—would begin on the last full working day of the week, Friday. The 365th day of the year would be called Year Day. It would be intercalated between December and January. In leap year the 366th day, to be known as Leap Day, would be intercalated between June and July.

Note that while this plan embraces the reforms which thoughtful students of the subject believe essential to increased accuracy and stability of the calendar, it is nevertheless conservative. It retains the twelve-month year. It retains the sound Julian principle of solar reckoning, and, what is highly important from the farmer's viewpoint, it insists upon rational and emphatic quarterly division of the year into seasons.

The second major plan of calendar reform, one for which considerable aggressive propaganda has been released, would provide for the division of the year into thirteen months of 28 days each. This plan, rigidly inflexible in many respects, lacks the seasonal balance inherent in *The World Calendar*. However, the principal objection to it which agriculturists

would advance, would be centered upon the radical and confusing departures from the present calendar which its provisions contain. The addition of another month to the farmer's year would bring chaotic results in his reckonings, and would greatly confuse or perhaps actually invalidate records and traditions which have guided him for centuries.

Of the two major plans for calendar reform, undoubtedly The World Calendar plan fits most closely the agricultural need. In this plan emphasis is placed upon the quarterly division of the year into balanced seasons—a feature which will make instant and strong appeal to a group whose activities are stringently regulated by the cleavage of the years into spring, summer, autumn, and winter: into planting time, growing time, harvest time, and dormant time. To recast the same thought in another form, we might point out that The World Calendar adheres strictly to the sound Julian principle of solar reckoning, with no flirtatious divergence into over-emphasis upon the week. It employs the sun and the seasons—the great natural "markers"—as the considerable elements in dividing and subdividing the year. Thus proceeding from the universal and the natural to the arbitrary and the artificial, it puts the weeks and the days in their proper places, if we may employ an apparent flippancy.

These advantages, it might be argued, we possess now in the present calendar. But undoubtedly they are given peculiar emphasis and greater prominence in The World Calendar, which is in addition more stable, better balanced. And for these reasons it affords the means of more accurate comparability of seasons and of periods of time within seasons.

But totally aside from the advantages which the farmer might secure through calendar reform, we must consider his reaction in the matter of ratifying such a measure should it be brought before him. And it is clear that The World Calendar, even granting his support of it be lukewarm, or completely lacking, will win such ratification more readily than any other system now under serious consideration.

Adoption of the thirteen-month calendar, with its insistence upon the week as the unit out of which the months and years are built up, whatever its alleged advantages to the business man, would create chaos in the reckonings of agriculture. The farmer cannot set up a new system of records at will, with a man-made plan and a sheet of white paper as the *deus ex machina*. He cannot create for his business a world of his own, with a statistical engineer in the rôle of Joshua, commanding the sun in its course. Buds burst and seeds sprout with startlingly slight dependence upon card indices and without benefit of filing clerks. The manufacturer and the merchant can fix the date which terminates the year's business for themselves. But only within the straitest bounds can the farmer hasten the harvest; and not until the four seasons have passed for weal or woe, can he "call it a year."

# DAY S AND DEITIES

By COLONEL ERNEST McCULLOUGH

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**W**HEN changes were made in the calendar in former days, they were imposed by the autocratic decrees of emperors, popes or potentates. Numa Pompilius, Julius Cæsar, Pope Gregory XIII, Charles IX, and many others come to mind as examples of those whose fiat have contributed to our present system of time measurement.

The job is still unfinished, having been left half-completed in the 16th century, and the present-day movement to correct the most glaring faults of the calendar can hardly wait until an all-powerful monarch again rules the world with sufficient power to put the desired reforms into effect.

Calendar reform in this modern age, therefore, must come into being by another means, presumably by the slow and often painful process of cumulative legislation by many nations.

But we may obtain some encouragement in this crusade if we remember that, even in the past, the arbitrary decrees of rulers were only effective when they received a fair amount of public acceptance. They failed ignominiously, as in the case of the French Revolutionary calendar, whenever they encountered persistent opposition from a formidable mass of public opinion. If such was the case in days of old, how much more important it is in these modern times to be certain of popular support before endeavoring to alter customs and habits that have been sanctified by long periods of usage.

My studies of calendar reform in many countries have convinced me that the great mass of public opinion everywhere is wholly indifferent. Few people are aware of the deficiencies of a calendar to which they have become accustomed by a lifetime of use. Most of them, however, will not actually oppose change, unless the proposed alteration is too drastic and revolutionary. They will only resist if their minds are inflamed against calendar reform by the agitation of some active minorities.

A simplification of the calendar is an accomplishment which is politically and economically logical, but the high value and importance of such a change in human life will not be appreciated by the mass of human beings until some time after it has been put into effect. Nevertheless, the inertia of the multitude will only be a serious handicap if it is organized into a strong party of opposition under fanatical leadership.

The possibility of such opposition is obviously present in the situation

as it exists today. If it develops, it will come from certain minor religious groups. Their opposition will be centered against the proposal to make the 365th day of the year a special holiday outside of the week, either without weekday designation or regarded as a "double Saturday." This, according to the minorities, constitutes an unwarranted meddling with the sacred traditions of the "seventh day" sequence.

On the other hand, spokesmen for liberal religion see no objection to the "Year Day" device, which will do more than any other thing to simplify our calendar. For example, 90 per cent of the Protestant clergy in this country favor this phase of calendar reform, while the Catholic Church has already indicated its well-known tolerance by stating that it has "no objection" to the proposal.

Opposition, therefore, will come from the fringes. In the Christian churches it will be led by a group of Seventh-Day devotees. Among the Jewish congregations, it will have the highly vocal support of the extreme Orthodoxists, who have already created organizations in several countries for the express purpose of opposing any interference with the orderly sequence of the sacred seventh day.

In this connection, I am reminded of an incident that happened to me a few days ago, which seems an excellent illustration of the real meaning of this type of opposition. I was visited by a committee which asked me to sign a petition addressed to the Governor and the State Legislature. Glancing down the printed page which they handed me, I noted that the petition demanded repeal of daylight-saving time, protesting against this legislation as an "interference with God's time."

I asked, quizzically: "Just what do you mean by 'God's time'?"

One of the committee, a long-faced man in sober black, replied: "The present standard time, of course!"

My mind went back to my childhood, and I remarked, reflectively: "I am a little older than most of you, I suppose—for I can remember a time fifty years ago when I circulated a petition of protest, on behalf of my own church authorities, against interference with God's time and the adoption of a new method!"

The committee stared at me incredulously. "I'm afraid you're mixed in your dates, sir," one of them said, politely. "Daylight saving was invented only 15 or 16 years ago."

"I was not referring to daylight saving time," I said, with a smile. "God's time in those days was sun time. The wicked innovation against which religious people then protested was the present standard time, which you now call God's time. Fifty years ago it was regarded as Satan's time, an invention of the Devil, railed against by politicians as something which the hated wealthy were trying to introduce, to lead people away from God."

The committee went on its way, without my signature. Some of its membership seemed to me to have become a little more thoughtful, as if the circulation of their petition did not offer as much pleasure as before.

That evening I participated, together with millions of my fellow citizens, in a daily rite performed before a diaphragm from which issue sounds conveyed through the air. This rite is called "getting the time." Bets have been made and money won and lost on the accuracy of watches as determined by this regulatory ceremony.

When listening to the words, "It is now exactly . . .", or, "When the gong sounds it will be . . .", memory recalled a similar event in a far-off land. Narrow, filthy streets lined on both sides with small shops and bazaars; all the odors of "Araby the blest" and humankind at its worst, mingled in an overpowering and suffocating aroma; open spaces filled with the faithful; a golden ball of light descending slowly in the west; tall towers, each with a faithful watcher; then the sudden call to prayer as the edge of the sun touched a certain point; people falling on their faces and praying; it was sunset and a new day had begun! Curious tourists, together with natives who possessed timepieces, adjusted the hands, and the rite of "getting the time" was over.

Provision for adjustment of the hands of watches is part of their mechanism; clocks are not so equipped, and changing the hands deranges the working parts. A story is told of a salesman who conceived the brilliant idea of selling clocks with movable faces in Turkey. Put into use, his idea proved him to have been, "as a good salesman," a poor astronomer. The basic idea was good but it did not work to the satisfaction of those who, accustomed to a small daily adjustment of their time-pieces, knew nothing about, or had paid little attention to, cumulative effects.

With the recent adoption by Turkey of the Gregorian calendar, Kemal Pasha introduced the western mean solar day in place of the sidereal day that began with sundown and the cry of the muezzin from his tower. The voice of the radio has replaced the voice of the muezzin; the daily shifting of the hands of timepieces has gone into the discard; corrections nowadays are in seconds "fast" or "slow."

Recognition of the sidereal day was brought to western nations when they adopted daylight saving time during the World War. The salesman who invented the movable clock face has been succeeded by one who announces a clock with a movable face and an adjustable base. He proposes a clock so mounted that it may be turned to the right and the left through a small angle, the face turning an equal amount in the opposite direction. This obviates all shifting of the hands and keeps the XII vertically above the VI when the clock time is changed an hour. Man, inventor of time, has become a slave to his creation.

Time really exists only in the mind of man and to him it is important, so important that he had to invent the mean solar day in order to effect a regular spacing of, and accounting for, events. This artificial day throws all corrections into days at irregularly spaced intervals; corrections being necessary so the artificial time-measures of man will correspond to the movements of the stars in their courses.

The disappearance of the sun probably was used to mark the first division of time when man had learned to count. Some one has said that the setting of the sun marked a new day because everybody saw the sun set, whereas the great majority, even in prehistoric times, preferred to lie abed in the mornings until the sun had warmed the air. Persistency of the habit, coupled with the need for increased accuracy in determining time, resulted in the erection of watch towers that have played such a large part in eastern religions, especially in Mohammedan countries. These towers were the first, the most crude, attempts at something resembling modern astronomical observatories. They probably served a treble purpose, i.e., to observe the operations of enemies; to help religious, military and civil leaders make announcements; they were astronomical observatories manned by priests who combined the duties of watchmen with study of the heavens. In time their shadows were utilized for measuring the seasons.

The various phases of the moon must have early attracted the attention of those whose monotonous watch developed their contemplative faculties. Following the day, the second time period must have been the month. From the most ancient times it had a certain religious significance from the fact that periods between definite phases corresponded in length quite closely to recurrence of menstrual phenomena. The moon became a guide in the cultivation of the fields, the planting of the crops; it was the mother of mankind, the Goddess of Fertility.

When a period intermediate between the day and the month was felt to be necessary, a division of the month into four quarters brought the week of seven days. History tells us that various rulers ordained weeks containing other number of days, from time to time in different countries, but the difficulty of making such divisions fit into a lunar month left the seven-day week as a logical survival. The persistence of this particular division of the month unfortunately resulted finally in a feeling that a certain sacredness attaches to the week of seven days, with special emphasis upon the Holiness of the Seventh Day.

The calendar has been changed many times, usually following the whims of autocratic rulers, as well as at the dictates of religious leaders. Notwithstanding this fact, that cannot be disputed, certain religious groups persist in claiming that the present calendar adequately marks the recurrence of the seventh day, a recurrence that has been guarded miraculously

from the beginning of time; any change from the present arrangement is contested on the ground that it is sinful. The Creator has placed many stars in the firmament and measurements of the passage of these stars across man-placed meridians indicate that there are really several possible months, none of which divide exactly into seven-day weeks. The mean length of time between one new moon and the next gives us the "synodic" month of 29.53 days, the difference between the longest and the shortest such month being thirteen hours. The "sidereal" month has an average duration of 27.32 days and the year comprises 12.369 synodic or 13.369 sidereal months. There are also the "anomalistic" month of 27.55 days and the "nodical" month of 27.21 days. It should, then, be evident that any arbitrary division of time made by man for his own convenience must require periodical adjustment to accommodate it to variations in the passage of heavenly bodies across fixed meridians in order to preserve the necessary sequence of the seasons. If such adjustments are not made, our months will gradually move from one season to another. Such changes when observed in the far distant past led to re-studies of current calendars and improvement by the "trial and error" method.

We know that after many alterations had been made in the calendar, Julius Caesar decreed a reform in the Roman calendar which has lasted for nearly 20 centuries. The work of Pope Gregory in 1582 corrected the error of the Julian leap year day, which if it had been overlooked for a sufficiently long period of time would have reversed the seasons. Adopted immediately in Catholic countries it was not accepted by England until 1752, and that is why George Washington was born February 11th (O.S.), and his birthday is celebrated on February 22nd (N.S.), for 11 days had to be dropped when the change was made. What is not so generally known is that in 1752 New Year Day was moved from March to January, and England fell into step with the world.

The work of reforming the calendar in 1582 was not completed. There still existed remnants of an ecclesiastical calendar, and Easter was left as a "movable" feast. This held back discussion of more changes until recently, when the heads of the principal divisions of the Christian religion agreed that a fixed Easter will be desirable.

The only religious objections to calendar reform now come from believers in the continuity of preservation of the Seventh Day, and these believers, though quite a small minority in the leading nations, are making themselves felt as an opposing force.

The impending reform, however, is purely economic in purpose and has as its primary, practically its sole, object the stabilization of successive years and the rationalization of the lengths of various months. A month containing 28 days is only 90.3 per cent of a month of 31 days; it is 93.3

per cent of a month of 30 days. These differences are important today when percentages, rather than numerical differences, are stressed. For example the statement of Professor Thorndyke, that "the difference between 3 and 4 is not the difference between 5 and 6," is often quoted by people one would not expect to say such a thing, with evidence of immediate comprehension by those who hear it.

The greatest benefit will come from the creation of a permanent and unchanging calendar. For each business one "best" day exists in every week. With the present irrational and varying distribution of week-days a month can have five best days in one year and only four in another. This difference creates annoying inequalities, and makes it impossible to compare one month properly with another.

When business began to swing definitely toward the organization of large corporations, with multiplication of small items dealt in, necessity was felt for a method of accounting that would make comparisons more intelligent. The time appears to have come when a sound business calendar should be used everywhere in the place of the one that was given to the world in 46 B.C. Not only does the proposed change in the calendar help business men, it also meets with the unqualified approval of scientists.

Whether it will be adopted appears to depend very much upon the attitude taken by the "man in the street," who thus far is largely uninformed. His support cannot be won through argument or ridicule, rather it requires patient education and calm discussion, with repeated presentation of historic facts.

If I were asked to outline a platform for the leaders of calendar reform, I would say "Avoid argument; work on those who have no fixed convictions against calendar reform; tell them how the calendar in common use is unsuited to modern business methods; tell them how easily and simply it can be changed."

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### ADVANTAGE OF FIXED EASTER

DR. S. PARKES CADMAN in *New York Herald Tribune*

The World Calendar Association has recently published a pamphlet by Elisabeth Achelis containing a scheme for which the following advantages are claimed: it provides a calendar balanced in structure and perpetual in form; it stabilizes all holidays and places them as a rule on Monday; it respects religious customs and arranges for Easter to fall regularly on a fixed date.

To achieve these results only seven changes are made in the existing calendar year. February is given two additional days; the 31st days of March, May and August are eliminated; April is given 31 days, and December 31 is converted into what is termed Year Day.

Pope Gregory rectified some defects of the Julian calendar. It is this calendar with which Miss Achelis deals, and I recommend her pamphlet to your attention. It is an exceedingly interesting and scholarly bit of work.

# IMPROVE WITHOUT UPHEAVAL

By PHILLIPPE GERIGNY

Secretary of the Societe Astronomique de France

(Abstracted from the French by C. D. Morris)

Calendar reform was one of the first subjects taken up by the French Astronomical Society after it was founded in 1887 under the presidency of Camille Flammarion. In a prize contest for the most workable plan of calendar simplification, the Society gave both its first and second awards to 12-month plans. It rejected as impracticable all the 13-month proposals. A voluminous report on the Society's researches was made by its secretary, M. Gerigny, and this was published in a series of articles in the Society's official organ, *L'Astronomie*. The following abstract is a summary of the most salient and pertinent parts of M. Gerigny's comprehensive report.

MANY current plans of calendar reform involve a proposal to divide the year into 13 equal months of 28 days each. This proposal has the advantage of offering months composed of an exact number of weeks. But it is an advantage purchased at the price of a tremendous inconvenience, for the prime number 13 is not susceptible of being divided into convenient parts. It does not permit either a half or a third or a fourth of a year to be set apart in an exact number of months.

On the other hand, the number 12 which we have in our present calendar furnishes a very convenient system of accessory divisions. The half of a year is six months—the quarter of a year is three months—the third of a year is four months.

It may be remarked in this connection that the faculty which "12" has of being divided into 2, 3, 4 and 6 parts is assuredly the reason that it has served so well as the basic unit for many time-honored systems of measurement. One can even confess to a certain feeling of regret that our whole system of numbers is not based on "12" rather than on the present decimal unit, which appears to have been imposed on the human race by the fact that our two hands contain ten fingers, which we used for counting in the early days of our racial history.

As for dividing the year into ten months, which is also suggested by some calendar reformers, it offers no advantage over the present system, since the 365 days of the year are not equally divisible by ten. The decimal system in fact is useful mainly for exact calculations and for written operations, and these are not the primary purpose of the month in measuring time. The 12-months system is certainly more advantageous for approximate calculations and mental figuring.

Any calendar reform which adds or suppresses months, or which proposes to change the method of dividing the year, offers more inconven-

iences than advantages and it also has the almost insuperable obstacle of imposing on the human race a complete breakdown of universal habits which are most difficult to change. It is obviously unwise to attempt any modification of this kind.

The month, of course, owes its origin to the period of the phases of the moon. Persians, Arabs and all Mohammedan races figured time by a calendar whose months were practically equal to the moon's periodic changes. The Jewish religion still follows a lunar calendar. Such also was the calendar of the ancient Greeks. But the astronomical year does not contain an exact number of lunar months and it is extremely difficult to build up a lunar calendar which has any accord or harmony with the sun. For instance, the Mohammedan calendar, composed of precisely 12 lunar months, is much shorter than the solar calendar, and the seasons in the Mohammedan reckoning make their way through the whole circle of the year in a comparatively short period.

The ancient Greeks endeavored to meet this difficulty by a combination of short and long years. Their short years, called "defective," contained 12 months; their long years, called "abundant," contained 13 months. The two kinds of years were adroitly scattered through a cycle of 19 years.

Then came the Romans, whose progressive tendencies were shown by the fact that they did not hesitate to sacrifice the lunar calendar, building up in its place a year composed of an exact number of months which varied from 30 to 31 days with no reference to the phases of the moon.

Such is the origin of the month as we know it today. It does not correspond to any astronomic period. The succession of the months bears no relation to the movements of the moon or the return of its phases. But does this result in the slightest inconvenience to us? With our manner of living and our habits, the moon's phases have no interest of sufficient importance to require recognition in our system of measuring time. Nobody dreams of preferring the Mohammedan lunar calendar to our Gregorian system. And it is not necessary to demonstrate the inconvenience of the complicated calendar which the Greeks used, with its "abundant" years and its "defective" years.

Our system provides us with months which are not exact twelfths of the year. Some of them have 30 days and some have 31. This is not entirely satisfactory, and there are certain inconveniences which result, but I am far from thinking that they supply any adequate reason for suppressing or changing the existing system of 12 months per year.

The month is an arbitrary unit of measurement, but a very convenient one, being intermediary between the day and the year, and very useful for general grouping of certain time periods. It is not adapted to exact calculations, but it is very handy in ordinary life.

If we decide then not to disturb the system of 12 months, which has the sanction of human acceptance over twenty centuries, let us examine the existing division of the 365 days among the various months. We have said that the 12-months system is too deeply rooted to be changed, and that any change would offer too few advantages to make it worth while. But it is a different matter with the allotment of the number of days among the 12 months of the year.

It is patently absurd that we should have seven months of 31 days, four months of 30 days, and one lonely little month of 28 days. This arbitrary division, which has no other reason for existence than certain idle circumstances dating back to the Roman Republic, has perpetuated itself across the ages in spite of its manifest inconveniences.

It destroys the symmetry of the four quarters and complicates endlessly every calculation of dates extending from one time to another.

The brevity of the month of February is a source of annoyance and loss of time to every person whose occupation is regulated or affected by the succession of months. Every one of us knows that it takes each year a distinct effort of attention to remember on the 27th of February that only one day is left before the new month comes in. The symmetrical distribution of days among the months is assuredly one point on which calendar reform should find no objectors.

The week, like the month, has no basis in any natural phenomenon. But the use of this period of seven days is so universal that no one dreams of suppressing it or modifying it. The necessity of a time unit containing a small number of days is absolutely established. The week is used to regulate most of the periodical occupations whose routine is not merely from day to day.

The week has a profound usefulness also in the fact that man must have one day of rest after several days of labor, and the regular recurrence of this day of rest is important and necessary for both his physical and mental well-being.

As for the length of the working period, this depends on physical conditions, which require that it shall not be too long, and on economic considerations, which forbid a too frequent return of the day of rest. Humanity seems to have agreed that the week, with one day of rest in seven, answers perfectly to these two conditions.

The French Revolution calendar tried to replace the week with the *decade* of ten days but the *decade* was too long. In practice, the French revolutionists divided it into two parts and took a day of rest every five days.

We may very properly conclude that the weekly period has been sanctioned by universal usage and that any proposal to modify it would be ill received by the public and would have no chance of success.

The lack of agreement between the days of the week and the days of the year is obviously the most serious fault of our present calendar. Every recurring date, every fixed holiday, every birthday or fete day invariably falls every year on a different day of the week.

All our daily routines find themselves ruled by two different systems, first, the days of the year, and then the days of the week. The two roll by independently of each other, and this fact compels us to look up complicated tabulations every time we have need to determine the day of the week on which a given date will fall.

This is not only inefficient and tiresome, but it is the source of many errors, delays and loss of time. Events and appointments fixed in advance may fall on Sunday.

Even though we have become accustomed to these inconveniences, they nevertheless exist and exact their price in time and energy. Yet all of them will disappear immediately if we arrange the calendar so that the days of the week and the days of the year always fall in the same pre-arranged order.

To do this, it is only necessary to construct a calendar which will be the same every year and will be sufficiently simple so that it can easily be committed to memory by every man, woman or child. This is the primary purpose and the most important aim of any plan of calendar simplification.

Some advocates of calendar reform go far beyond this point, suggesting that the same day of the month shall always fall on the same day of the week throughout the whole 12 months of the year. Unhappily, such an achievement is impossible without introducing revolutionary changes which from a practical standpoint are inadmissible. It is accomplished by those who propose to divide the year into 13 months of 28 days each, but supporters of this plan appear to have been magnetized by the ingenious quality of a month containing exactly four weeks without being impressed by the awkwardness of dividing a year into 13 parts instead of 12.

Sane and practical reform of the calendar is desirable. The calendar can be made perpetual in the sense that every year's calendar will be identical. I am convinced that the most suitable project of reform is based on a division of a year into 12 months of four equal quarters, with each quarter containing precisely 13 weeks. The year is then completed by a 365th day which supplements the 52 weeks, but has no place in the week and is called "Year Day." (In Leap Years there would be another extra day of the same character.)

Under this plan every year would commence on the same day and perpetually any given day of the year would fall on the same day of the week.

There is nothing really revolutionary in such a reform. It can be put into effect almost without being perceived, and certainly without any serious inconvenience to anyone.

In our study of calendar reform, let us admit frankly that the Gregorian calendar has behind it the authority of a tradition of twenty centuries and that it is inseparably bound to the habits of all civilized men. However much we may desire to correct all of its irregularities and inefficiencies, we must be practical. We must recognize that it is not possible to impose upon the world a too radical change in habits as old and deeply rooted as those which are involved in our everyday use of the calendar.

We must therefore restrict our projects of reform to the most essential points and to modifications which we can show are uncontestedly important, which do not involve any serious inconveniences or upheavals. The advantages must be vital enough to overcome the disadvantage of such temporary inconveniences as are naturally attached to any important change in human life.

Even if we are not particularly imbued with a deep sentiment of respect and affection for ancient customs, there is a certain grim necessity which will oblige us as calendar reformers to be very circumspect in altering the old system. There is no point in seeking to construct a calendar which from the speculative or theoretical point of view is most rational, most scientific or most perfect. Calendar reform is a practical question, and we must find a practical method of dealing with calendar irregularities, a method which may conceivably be realized in the domain of actual fact and be adopted to the actual benefit of people of the present generation as well as those who are to live in a distant future. It is obviously essential that we devote our zeal as calendar reformers to some system which is both possible and generally acceptable.

However perfect our project of reform may be from the viewpoint of logic or science, it will be merely a useless dream if those whom it is designed to serve should refuse to accept it.

As a matter of fact we present-day calendar reformers find ourselves in a somewhat less advantageous position than the reformers of ancient times. Both the Julian calendar and the Gregorian calendar were imposed on the world by men who could command obedience. Julius Caesar was the dictator of Rome and the master of the civilized world. There was nobody who dared refuse to obey him. Pope Gregory in 1582 enjoyed an influence almost equally powerful. He was the head of the Church and set all the dates for celebration of religious festivals. His principal purpose in inaugurating his reform was to get religious dates into a sounder position in the calendar.

His orders had the implicit obedience of all Catholic countries, and at

that time the Catholic nations were so powerful and influential that other nations were practically forced to follow their example. Even so, Protestant countries resisted the Gregorian calendar for a long time, preferring to be out of harmony with the sun rather than in harmony with the Pope. Germany, Denmark, Sweden and Switzerland did not accept the reform for nearly 20 years. England and America held out 200 years. The nations of the Greek Church and the Armenian Church were still more laggard.

Circumstances today are entirely different from those which existed in the carrying out of these earlier calendar changes. No one can hope for the powerful authority of a world monarch to enforce calendar simplification, nor is there any Pontiff whose edicts would be all-powerful. Calendar reform today must depend on the free consent of many different governments. It is certain that every attempt at calendar reform will encounter a more or less lively resistance.

Therefore, we who believe in calendar simplification must seek to avoid objection as far as possible by introducing no factors that do not recommend themselves universally by their undeniable practical advantages. It is even necessary that their advantages shall be so evident as to compel everybody's attention and so obviously sound that their adoption will compensate instantly for all the inconveniences that might result. Only such a plan can hope to gain adherents numerous enough to make success possible or likely.

It is this definite, practical consideration that forces us to abstain from any calendar proposal of a character even slightly theoretical or speculative. More than that, we must resign ourselves to leaving untouched such imperfections of the calendar as do not carry any material inconvenience. We must deal exclusively with irregularities which are a source of annoyance, inefficiency or loss of time in the common life of every human being.

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### STILL ON FAMILIAR GROUND

*Erie Railroad Magazine*

More than 200 different proposals for calendar reform are already under consideration at Geneva, but of them all, only two are regarded as really practicable. One of these, supported by George Eastman of Rochester, offers the far too radical suggestion that the world experiment with a 13-month calendar, in which each month would have exactly 28 days, or precisely four weeks. The other plan, which meets all the needs of the situation without any upsetting innovations, is an American plan, backed by The World Calendar Association. It holds to 12 months, but readjusts the length of various months so that each month has exactly the same number of working days.

The so-called "World Calendar" plan, with its orderly procession of 12 simplified months, will undoubtedly win many friends through the simplicity with which it meets the situation. It leaves us still on familiar ground—it recognizes our same old twelve months, our familiar four seasons.

# TWELVE OR THIRTEEN

By CHARLES CLAYTON WYLIE

*Secretary-Treasurer of the University Association for the Study  
of Calendar Reform, President of Midwest Meteor Association,  
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ALL the consequences of a change in the world's calendar cannot be foreseen by anyone; but it will assist materially in clearing the ground for an intelligent discussion to have readers of this journal contribute comments and suggestions, each giving his opinion of the probable effect of the proposed changes on persons in his own line of work. The average intelligent reader will realize that he does not have enough information to pass an opinion on the effect on the world at large of the proposed change from twelve to thirteen months, but he can foresee effects in his own field of work. No doubt many will think of important effects not mentioned in this journal. They should also consider whether putting the chief business and community events on a permanent schedule would benefit the public in their own communities. This much can be easily done without waiting for legislative action.

It should be emphasized that it is not necessarily essential to have the month an exact multiple of the week. Millions of Americans use quarters and dimes daily in their purchases. Would it be a great convenience to the public at large to change our money system so that the dollar has five quarters, each quarter containing two dimes? This would make the quarter an exact multiple of the dime, but would the inconvenience resulting from that change be greater than the inconvenience caused by the fact that the dollar could not, as at present, be divided into fourths and halves by quarters?

It was some twenty years ago, when the writer was a college student, that he first learned of the proposal to reform the calendar. His instructor explained that by leaving out one day of the year (two in leap year) as a blank day, the year could be divided into thirteen months of twenty-eight days each, each month four weeks and all months exactly alike.

This sounded very well, and doubtless nearly all members of the class assumed that the only reason for not making the change at once was the natural slowness of the world to adopt a change of any kind. A few years later, however, when the subject came up, the writer was doing more independent thinking, and the question occurred "What difference does it make to me in my work whether or not the months are each exactly four weeks?" The answer appeared to be "Very little." The next logical question was "Would the change to a thirteen-month year inconvenience me in any way?" To this, the answer was "Yes, in several ways."

Several other persons have probably had the same experience, for in spite of the formidable list of supporters of the thirteen-month plan, examination of a number of scientific journals shows little support. Articles favoring twelve months are more than five times as numerous as those favoring thirteen. Authors favoring twelve months included some of America's foremost scientists, while the authors advocating thirteen months included no one connected with a university.

Let us critically examine the probable effects of the proposed change. One of the foremost scholars, Alexander Philip, believes that the taking of a day from August and adding it to February is the only change really essential. This makes the quarters numerically equal (except for the extra day), and he considers the months with that alteration nearly enough equal. There are many seasonal and other inequalities in income or expenses, or both, which nearly every firm and individual must expect.

The majority of scholars have, however, favored more change, if agreement could be secured. In 1884-1887 an international competition on calendar reform was held under French auspices. Although the thirteen month calendar had been advocated by the French philosopher, Auguste Comte, both first and second prizes were awarded to twelve-month calendars with each quarter three months of 31, 30, and 30 days. The plan of Monsieur E. Hanin of Paris, awarded second prize, is almost identical with that favored by the officers of The World Calendar Association, and described elsewhere in this journal.

Other twelve-month calendars have received strong support, especially the equal quarters of 30, 30 and 31 days, with each quarter beginning on Monday, proposed by Monsieur L. A. Grosclaude of Geneva, Switzerland, but these will not be discussed in detail.

In the United States, a well organized group with strong financial support is now working for the thirteen-month calendar, with months which are equal and alike, except for the extra day, each month being a group of four weeks. The members of this organization are strongly impressed with these points, and are willing to sacrifice for their attainment the obvious advantages of our present division into twelve months. Let us consider the question from the viewpoint of different groups.

*The Business Man.* The average intelligent business man does not close his books both weekly and monthly, and the fact that the month is not an exact multiple of the week does not particularly interest him. He is not an expert accountant, so he compares his business only with the corresponding period a year ago. For this purpose the thirteen-month year offers no advantage; and on the points listed below, the twelve-month year is preferable:

1. The week-end is a busy time for the average business man, and the month-end is also a busy time. Having the extra work of the month-

end always coincide with the extra work of a week-end is not desirable.

2. Thirteen months in place of twelve would, assuming that the present monthly billing be continued, mean the mailing out of many monthly bills where the sum involved is too small to justify even twelve collections per year. It would mean an additional month-end each year.

3. The business man can now consider one-sixth of a year as two months, one-fourth of a year three months, one-third of a year four months, and one-half of a year six months, while with the thirteen-month year none of these fractional parts would be an exact number of months.

4. With the twelve-month year, quarterly and semi-annual payments of insurance premiums, interest, or coupons fall due on the same day of the month, which would not be the case with the thirteen-month year.

5. The common loan and discount periods of fifteen, thirty, sixty, and ninety days have been adopted because of their convenience in interest calculations. They fit the twelve-month year with its months of about thirty days much better than they would fit the thirteen-month year with months of twenty-eight days. If the thirteen-month year were adopted either the interest and discount periods would fit the months poorly, or it would be necessary to change the periods to multiples of weeks, for which the interest calculations on common annual rates are much more cumbersome.

6. In addition to the preceding objections, it is well to point out that although the months would be equal numerically under the thirteen-month plan, except for the twenty-ninth day of December, and the extra day in leap year, they could not be considered equal in accurate statistical comparison. For such work, holidays and seasonal differences would necessitate corrections, as with the twelve-month year. It should also be pointed out that the fixing of holidays on Monday can be made as easily with other plans as with the thirteen-month plan, if the public so desires.

*The Astronomer.* The week has no significance in nature, and so the astronomer does not need to consider the day of the week in his records, and is not concerned with the relation of the week to the month. For his purposes, the twelfth of a year is a much more convenient unit than the thirteenth, and articles written by astronomers have almost uniformly favored the retention of the twelve-month year. In the volumes for six astronomical and two other scientific journals examined as stated in the preceding paragraphs, *no articles written by astronomers* favored a thirteen-month calendar, and several were definitely against it. The following are reasons for astronomers preferring the twelve-month year:

1. With the twelve-month year each season can be considered three months, while with the thirteen-month year fractions would be involved.

2. With the twelve-month year there is a six-month difference between seasons in the northern and southern hemispheres. This would

be changed to six and one-half months under the thirteen-month calendar.

3. With the twelve-month year the times of sunrise and sunset are interchanged in six months. This would be changed to six and one-half months by the thirteen-month calendar. Nature divides the year into halves and quarters by the solstices and equinoxes, and these natural units fit poorly into a thirteen-month calendar.

4. The number of hours of day and of night is interchanged on a date six months different.

5. The formula for approximately calculating the sidereal time when mean solar time is given, and vice versa, is simplified by the fact that the numbers of hours in the day is double the number of months in the year. The calculation can be made mentally with a twelve-month year, but would be quite involved with a thirteen-month year. Even when the calculation is made by the use of tables it is convenient to have a method of checking the result approximately by a simple mental calculation.

6. With the twelve-month year the position of the stars is the same at a certain hour as it was a month earlier and two hours later in the same evening. In other words, the position of the stars changes two hours per month with the twelve-month year.

7. The star charts in common use have been calculated on the basis of a twelve-month year, some charts being sets of twelve, one for each month of the year, and other charts marking the stars on the meridian at a certain hour on the first or fifteenth of each month. It would be necessary to construct new star charts less easily used if the thirteen-month year were adopted.

8. With the twelve-month year the sun moves through each constellation of the Zodiac in a month.

9. Simple rules for calculating mentally the time of night from the position of the Big Dipper or certain other stars depend on the fact that the number of months in the year is the same as the number of hours on the dial of a clock or watch.

10. The thirty-day month of the twelve-month year fits the lunar month (29.53 days) reasonably well, and the date of full moon or of any other phase changes slowly from month to month. With the twenty-eight day month the change would be more rapid.

11. The altitude of the sun above the southern horizon (in the northern hemisphere) at noon on a certain date is the same as the amount the midnight sun is below the northern horizon on a date six months different. (This is useful in discussing twilight throughout the summer night, in Europe and Canada, or the visibility of the sun at midnight in arctic regions.)

12. The direction and apparent position of the full moon at any hour of the night is nearly the same as that of the sun at the same hour of day

on a date six months different. Thus in late December the full moon rises about 4:30 P.M. in the northeast, at 9:00 P.M. is high in the eastern sky, crosses the meridian south of overhead at midnight, and sets in the northwest about 7:30 A.M. On a date six months different, or in late June, the sun rises in the northeast at about 4:30 A.M., is high in the east at 9:00 A.M., crosses the meridian south of overhead at noon, and sets in the northwest at about 7:30 P.M.

13. The moon at first quarter is in the constellation in which the sun will be three months later, the full moon is in the constellation in which the sun will be six months later, and at last quarter the moon is where the sun was three months ago.

14. The effects of parallax and aberration on a star's position are a maximum when observations are obtained at dates differing by six months.

*The Public.* It makes no difference to the average citizen in his personal accounting whether or not the month is an exact multiple of the week. He neither knows nor cares how the chain store with which he is trading closes its books, whether weekly, every four weeks, monthly, or in some other way. Some realize that a permanent schedule for the community would be a convenience, but this can be attained as readily with less radical proposals as with the thirteen-month plan. The changes which would affect the average man under the thirteen-month plan are:

1. Throughout his lifetime he would be inconvenienced by the confusion produced. He would miss the familiar twelve months he has been using for dating purposes, and would find it difficult to adjust himself to new dates for holidays, anniversaries, and certain seasons. Alexander Philip, in his book "The Calendar," expresses the opinion that the prohibition of the use of our familiar months could not be enforced, and that the use of the new months by some and the old months by others would bring about endless confusion.

2. The average successful citizen has quarterly and semi-annual payments of interest, insurance premiums, taxes, or bond coupons. It is convenient to have these fall due on the same day of the month, which would not be the case with the thirteen-month year.

3. Everyone would have the month-end work and expense of paying and perhaps collecting bills an extra time in the course of the year.

4. It is convenient to have the year divisible into various fractional parts by months. The thirteen-month year is not so divisible, and by weeks it is only divisible into halves and quarters.

5. Several of the points mentioned in connection with astronomy are a convenience for the average citizen, especially if he has children in school. For example, it is convenient to have each season three months, to have a six-month difference in the northern and southern seasons, and to have the times of sunrise and sunset interchange in six months.

# EXCERPTS AND REVIEWS

## French Revolutionary Calendar

By GEORGE GORDON ANDREWS

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(Extract from article in American Historical Review, April, 1931)

IN VIEW of the recent agitation for calendar reform, the French venture during the Revolution assumes a new interest. It was the last serious attempt to solve the baffling problem. Today both advocates and opponents of change may look back to it for comfort and counsel, the former determined that the lessons of history shall not be in vain, and the latter confident that history will repeat itself.

The general plan of the Republican Calendar was outlined in the law of November, 1793. The year was divided into twelve months of thirty days each, with five complementary days and a sixth every leap year in order to maintain the coincidence with the solar year. Each month was divided into three 10-day periods called *decades* and the week was abolished. The first year of the Republic was decreed as beginning September 22, 1792.

With the reconciliation between Napoleon and the Church, the Republican Calendar was doomed, and by the law of September, 1805, the old calendar was restored January 1, 1806.

The success or failure of a project is largely determined by the circumstances under which it develops. In this case they were not favorable. The demand for a reform of the calendar was neither unanimous nor even the desire of a majority in France. It was initiated and carried through by a group of zealots who were in general actuated by two chief motives. The first was a legitimate desire to provide a more logical and effective system for the reckoning of time, in which the triumphs of the Revolution would be commemorated. The second was undoubtedly a definite intention to reduce, if not to destroy, the influence of Christianity and the Catholic Church. Difficulties and opposition were bound to be encountered in the attempt to realize both objectives.

The chief causes for the failure of the

new calendar were inertia, the influence of custom upon those not definitely against it, and the determined hostility of those whose religious sensibilities it outraged. Villain was perhaps not far wrong when he wrote: "If religious passions had not come to lead all Catholics to resist the calendar, it is probable that the difficulties provoked would have been gradually overcome, and that the Republican Calendar, which is certainly in many ways superior to the old one, would have ended by being adopted by all France."

## Proposals for Reform

By J. H. RICHARDSON

International Labor Office, Geneva

(Extract from article in International Labor Review, August, 1927)

DIFFERENT schemes of calendar reform examined by the League of Nations total nearly 200. Many of these were found to be merely minor variations of a few general types, while a considerable number of proposals were regarded as useless or impracticable. The Committee therefore decided to direct the attention of the public exclusively to certain main groups of reform.

The first of these groups involves only a comparatively small modification of the existing calendar. The year would consist of 12 months, the 365 days being distributed in such a way that the quarters and months would be as nearly equal as possible. Three of the quarters would consist of two months of 30 days each and one month of 31 days, while the remaining quarter would consist of one month of 30 days and two of 31 days. The adoption of this scheme would cause little disturbance; on the other hand, the advantages are so small that it may be doubted whether they are of sufficient importance to justify a change.

The other two main groups of reform are based on the application of a new principle. It is recognized that there is no possibility of constructing from 365 days a regular calendar, containing months or quarters of equal length. This object

could, however, be attained by means of 364 days. It is therefore proposed to adopt this number of days as basis for the calendar, the 365th day (two days in Leap Year) being considered an extra day.

With regard to the 364 days, the alternative proposals are: (1) Twelve months, eight of which would consist of 30 days and four of 31 days; (2) Thirteen months of 28 days each.

Both these schemes have the advantage, not possessed by the first main group of reforms that, by adoption of the extra day, a perpetual or invariable calendar would be established.

The 13-month scheme would involve a greater departure from the existing system than would the alternative proposal. It would be likely therefore to arouse more opposition, including even the unreasonable but popular prejudice against the so-called unlucky number "13."

The 12-month perpetual calendar has the advantage of involving less change from the existing system. Its adoption would cause less interruption in continuity of statistical data.

Many of the advantages which would result from reform would benefit employers and workers rather as members of the community than as employers and workers. But there are certain advantages of reform which would be of special benefit to them. Chief would be greater facility of statistical comparisons.

## Changes Contemplated

By CLARENCE M. DILLON

Secretary, Insurance Section, Chamber of Commerce, Wilmington, Del.

(Extract from article in Wilmington Magazine, April, 1931)

IT SEEMS almost certain that the world will soon be operating under a "perpetual calendar" of one kind or another. The calendar for any one year will serve equally well for all subsequent years. More than 185 proposals for calendar change have been submitted to the League of Nations, some of them absurd, others too complicated or too revolutionary to deserve consideration. The two plans which will vie for approval at the international meeting in October are one providing a 13-month year, the other a rectified 12-month year.

The calendar of 12 months irons out practically all the annoying inequalities of the present system. It makes the four quarters exactly equal, and its changes are such that the shift from the old system to the new would cause no legal or business difficulties.

Most business men feel that the extra month proposed by advocates of the 13-month calendar would be a good deal of a nuisance, and the 12-month revision proposed by The World Calendar Association offers a decided advantage in its quarter-years and half-years containing the same number of days.

There is no doubt that an enormous interest in the history of the calendar will be created as soon as the public becomes aware that these changes are actually close at hand. And the history of the calendar is a fascinating study in human nature.

No record exists as to the early history of the calendar, but research has demonstrated that the prehistoric ancestors of all great nations counted time by the moon. Biblical students maintain that the genealogies of the patriarchs should be interpreted in this way: Methuselah's 969 years representing 969 passages of the moon, or 79 years as we now measure time.

The Israelites later adopted the Egyptian method of 30-day months, and fixed five of these months as their time-unit, this being a simpler and safer way of rationing their tribal supplies. Later they extended their time period to six months. Jacob's 147 years were calculated according to the latter system, so that he lived 73 years as now measured. After the Exodus, when the Israelites fully adopted the Egyptian year, the Biblical characters were recorded as living only the normal number of years from our standpoint.

The Egyptians were the first to work out an accurate calendar. The Pyramids were presumably constructed as huge sundials, and by them the astronomers were able to observe the noon shadow of the sun for measurement, and to calculate the solar year exactly. Thus the astronomers were able to correct their twelve 30-day months, adding five extra days at the end of the year as a period of religious festivities.

# JOURNAL OF CALENDAR REFORM

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CALENDAR reform is needed in many fields of human activity because our present system, with its annoying irregularities and shifting days, is hampering progress. To improve the calendar, therefore, is important and toward this end the League of Nations has called an International Conference in October, to which member and non-member nations are invited. With a revision of the calendar so imminent, the public asks for enlightenment on the subject and information as to its progress.

The Journal of Calendar Reform aims to serve this educational and informative need. It welcomes opinions, criticisms and suggestions, for vital public interest is necessary to insure acceptance of the most workable plan for universal use.

Until The World Calendar, a revised twelve month year, was presented to the United States, only one proposal had been seriously offered for consideration. This was the International Fixed Calendar, frequently called the thirteen-month plan. The World Calendar Association, believing this plan too extreme for national and international adoption, offers an improved twelve-month plan, a reasonable system in which the year is divided and arranged in a regular order, to serve fittingly the present-day need.

Any agreement on this important subject made by the League of Nations will no doubt take the form of a treaty, which will require separate ratification by the different governments before becoming law in each country. If an accord is reached at the International Conference this autumn, calendar revision may become effective January 1, 1933; but if the League does not arrive at any definite decision calendar reform will probably be delayed six years until January 1, 1939, for it is advisable to inaugurate a new calendar when the first of a year falls on a Sunday.

An improved calendar for the general use of nations and peoples would be an immeasurable benefit to present and future generations. All nations, all religious bodies, every kind of organization and every individual should cooperate toward this desired goal.

# CURRENT PRESS COMMENT

## Bar Association Studies

*Plymouth (Ind.) Democrat*

A change in the old-fashioned calendar is indicated by the fact that the subject is now being considered by the American Bar Association, which is regarded as one of the most conservative bodies in the United States.

The proposed 12-month calendar recognizes the year as the principal unit upon which to base time measurement. Under this system, the year will always begin on the first day of the week, Sunday. It will always end on "Year Day," a special international holiday and a double Saturday. "Leap Day" every four years, placed in midsummer, is similarly treated.

As compared with a 13-month calendar, it is urged that the suggested changes in the 12-month system will accomplish all the simplification that is necessary, at the same time avoiding increased expense of extra monthly accountings, billings, tabulations and reports. It also avoids unnecessary litigation which an added thirteenth month might bring.

## Not Too Radical

*Milwaukee Tabernacle Review*

The International Fixed Calendar of 13 months is more simple and uniform than The World Calendar, as the same calendar would do for every month—but it is so radical a change from a year of 12 months that probably The World Calendar will be preferred, as it provides for a year of 12 months without any great upheaval from our present system.

## Hotels Seek Reform

*Los Angeles Pacific Coast Record*

Here is a calendar revision that seems to have real merit—better than a 13-month year. With a great number of business organizations attempting to revise the present calendar with its jumble of odd day months, odd weeks, odd quarter-years, and other inconsistencies, there are naturally many proposals for improvement, one being a 13-month year. This

has never been very enthusiastically endorsed, although repeatedly coming before the American Hotel Association and being used in a few isolated hotels at present.

Because of the fact that a 13-month calendar does not divide into quarter or half years, it has quite a few difficulties, and it would probably take many years, up to a half century, to get the world at large to consider it seriously, thereby causing immeasurable confusion. It would seem that the hotel fraternity should get together with The World Calendar Association rather than on the 13-month plan which had a number of very energetic proponents, among them Ralph Hitz of the Hotel New Yorker, who has appeared at every session of the American Hotel Association for several years past advocating it.

## Labor Viewpoint

*Augusta (Ga.) Labor Review*

The World Calendar is far less radical and less upsetting in its suggested changes, retaining the 12-month year, but lengthening February to 30 days, and making a few other alterations which will bring the four quarters of the year exactly the same in length and arrangement.

## Hearing All Sides

*Sioux City (Ia.) Advocate*

The World Calendar Association believes that in a matter so important as calendar reform, all sides of the question should be equally represented. When, therefore, a new calendar is adopted, which it ultimately will be, the world and all nations should be given the best calendar after it has had a full discussion.

## Persuasively Stated

*Catholic World*

The merits of The World Calendar, as against other suggestions for calendar reform, are fairly and persuasively stated by Elisabeth Achelis in her booklet.

# MEMBERS OF THE WORLD CALENDAR ASSOCIATION

485 Madison Avenue, New York City

*Membership is based on an active interest in the study of an adequate and effective improvement of the calendar. Owing to lack of space, a large number of names have been omitted. They will be printed in future issues.*

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